Inertial Labs
a VIAVI Solutions company

IMU-NAV-200

High Performance MEMS Inertial Measurement Unit

ITAR FREE

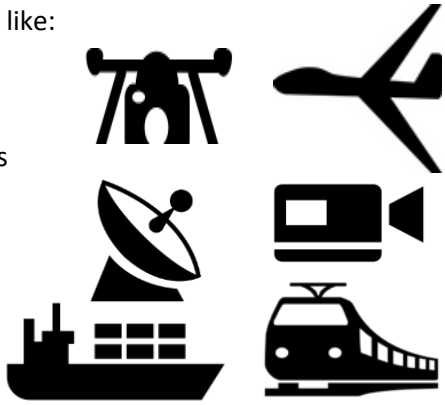
The **Inertial Labs MEMS Inertial Measurement Units (IMU-NAV-200)** are the latest addition to the Inertial Labs Advanced MEMS sensor-based family. Revolutionary due to its compact, self-contained strapdown, tactical grade Inertial Measurement Systems and Pitch & Roll Sensor, that measures linear accelerations, angular rates, Pitch & Roll with three-axis high-grade MEMS accelerometers and three-axis tactical grade MEMS gyroscopes. Angular rates and accelerations are determined with high accuracy for both motionless and dynamic applications.

The **Inertial Labs IMU-NAV-200** is a breakthrough, fully integrated inertial solution that combines the latest MEMS sensor technologies. Fully calibrated, temperature compensated, mathematically aligned to an orthogonal coordinate system, the IMU contains up to 0.3 deg/hr gyroscopes and less than 0.007 mg bias in-run stability accelerometers with very low noise and high reliability.

Continuous Built-in Test (BIT), configurable communications protocols, electromagnetic interference (EMI) protection, and flexible input power requirements make the **Inertial Labs IMU-NAV-200** easy to use in a wide range of higher order integrated system applications.

The **Inertial Labs IMU-NAV-200** model was designed for applications, like:

- Guidance & Navigation in GPS-denied environments
- Antenna and Line of Sight Stabilization Systems
- Passengers trains acceleration / deceleration and jerking systems
- Motion Reference Units (MRU)
- Motion Control Sensors (MCS)
- Gimbals, EOC/IR, platforms orientation and stabilization
- GPS-Aided Inertial Navigation Systems (INS)
- Attitude and Heading Reference Systems (AHRS)
- Land vehicles navigation and motion analysis
- UAV & AUV/ROV navigation and control



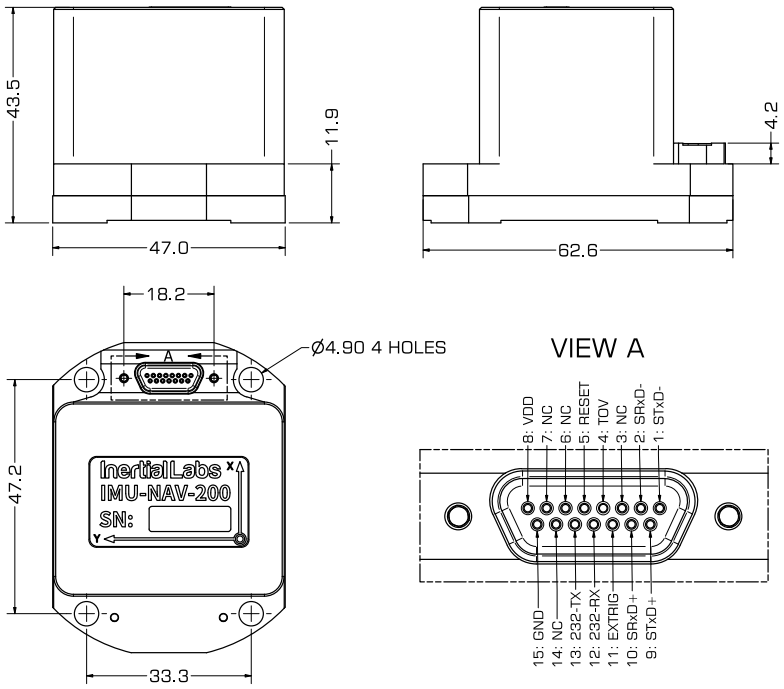
Gyroscopes & Accelerometers Key Performance

Parameter	IMU-NAV-200
GYROSCOPES (±450 deg/sec range)	
Gyroscopes Bias in-run stability (Allan Variance)	0.3 deg/hr
Gyroscopes Noise - Angular Random Walk	0.04 deg/√hr
ACCELEROMETERS (±40 g range)	
Accelerometers Bias in-run stability	0.007 mg
Accelerometers Noise - Velocity Random Walk	0.025 m/sec/√hr
PITCH & ROLL	
Pitch & Roll static accuracy, RMS	0.03 deg
Pitch & Roll dynamic accuracy, RMS	0.06 deg

SPECIFICATIONS

	Parameter	Units	IMU-NAV-200
GENERAL	Output signals		Accelerations, Angular rates, Pitch, Roll, Relative Heading, Temperature, Synchronization
	Update rate	Hz	4000
	Start-up time	sec	<1
	Latency (group delay)	msecs	<1.2
	Gyroscopes	**Units**	
PERFORMANCE	Measurement range	deg/sec	±450
	Bandwidth (-3dB)	Hz	500
	Data update rate	Hz	4000
	Bias in-run stability (Allan Variance, RMS)	deg/hr	0.3
	Bias instability (over temperature range, RMS)	deg/hr	30
	SF accuracy (over temperature range)	ppm	200
	Noise. Angular Random Walk (ARW)	deg/√hr	0.04
	Non-linearity	ppm	200
	Axis misalignment	mrad	0.2
	Accelerometers	**Units**	
	Measurement range	g	±8 / ±15 / ±40
	Bandwidth (-3dB)	Hz	1000
	Data update rate	Hz	4000
	Bias in-run stability (Allan Variance, RMS)	mg	0.003 / 0.005 / 0.007
	Bias instability (in temperature range, RMS)	mg	0.4 / 0.5 / 0.6
	SF accuracy (over temperature range)	ppm	150 / 300 / 500
	Noise. Velocity Random Walk (VRW)	m/sec/√hr	0.008 / 0.018 / 0.025
	Non-linearity	ppm	150
	Axis misalignment	mrad	0.2
	Inclinometer	**Units**	
	Measurement range, Pitch / Roll	deg	±90 / ±180
	Data update rate	Hz	2000
	Resolution	deg	0.01
	Static accuracy, RMS	deg	0.03
	Dynamic accuracy, RMS	deg	0.06
	Environment	**Units**	
ELECTRICAL & MECHANICAL	Mechanical shock (MIL-STD-810G)	g	40, 0.011 half-sine pulse
	Vibration (MIL-STD-810G)	gRMS, Hz	7, 20 – 2000
	Operating temperature	deg C	-40 to +85
	Storage temperature	deg C	-50 to +90
	Low pressure	Pa, min	1750, 30
	Humidity	%	up to 95
	MTBF (G_M @+65degC, operational)	hours	100000
	Life time (operational)	years	10
	Life time (storage)	years	17
	Electrical	**Units**	
	Supply voltage	V DC	5 to 30
	Power consumption	Watts	3 @ 5V
	Output Interface	-	RS-232 and RS-422
	Output data format	-	Binary, ASCII characters
	EMC/EMI/ESD	-	MIL-STD-461G
	Physical	**Units**	
	Size	mm	62.6 x 47 x 43.5
	Weight	grams	155
	IMU version using customized case & connector	custom	Available

MECHANICAL AND ELECTRICAL INTERFACE



Notes:

- All dimensions are in millimeters
- All dimensions within this drawing are subject to change without notice
- Customers should obtain final drawings before designing any interface hardware
- Please contact Inertial Labs if you need IMU to be delivered in a custom enclosure/case with customized connector and output data

PRODUCT CODE STRUCTURE

Model	Gyroscope	Accel	Calibration	Connector & Enclosure	Color	Version	Interface
IMU-NAV-200	G450	A8	TGA	C5	B	V1._	_.12
		A15					
		A40					

Example: IMU-NAV-200-G450-A15-TGA-C5-B-V1.12

Product Code details:

- IMU-NAV-200: High Precision MEMS Inertial Measurement Unit
- G450: Gyroscopes measurement range = ±450 deg/sec
- A8: Accelerometers measurement range = ±8 g
- A15: Accelerometers measurement range = ±15 g
- A40: Accelerometers measurement range = ±40 g
- TGA: Gyroscopes and Accelerometers
- C5: Aluminum Enclosure, 15-pin connector
- B: Color – Black
- V1: Version 1
- _.12: RS-232 and RS-422 interfaces